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In re Application of :
Ren et al. :
Serial No.: 09/882,699 :
Filed: June 15, 2001 :
For: Metallic layer component for use in a direct oxidation fuel :

DECISION
ON PETITION

This is a decision on a petition under 37 CFR 1.144 filed May 28, 2003 requesting review of a restriction requirement or, more properly, a requirement for species election set forth in the Office action mailed October 11, 2002 and made final in the Office action mailed January 29, 2003.

That species election requirement involved nine groups of species viz. claims 1-12 (I), 13-22 (II), 23 (III), 24-62 (IV), 63-70 (V), 71-92 (VI), 93-103 (VII), 104-109 (VIII) and 110 (IX). For future reference, the group number is set forth as a Roman numeral within parenthesis beside each set of claims.

It is noted that the examiner referred to the species of each of Groups I through VIII as being drawn to a direct oxidation fuel cell despite the fact that the claims of certain Groups, viz., II, V, VII and VIII, themselves recite a direct oxidation fuel cell "system." Although that is potentially confusing, nevertheless, it appears reasonable to proceed on the basis that the examiner divided the present claims into various species of a direct oxidation fuel cell and, likewise, various species of a direct oxidation fuel cell system. It is further noted that the examiner unaccountably included Group III in the species requirement even though the sole claim 23 in that Group was cancelled by a preliminary amendment filed June 18, 2002. Henceforth, this group is dropped from the discussion below.

The applicants elected to prosecute the species of Group IV, claims 24-62, drawn to a direct oxidation fuel cell, and traversed the species requirement. See the amendments filed November 12, 2002 and January 3, 2003.

Following an Office action on the merits, the applicants amended the claims of Group IV by introducing certain limitations for an anodic as well as a cathodic metallic diffusion layer and added new claims 111-113 dependent from claims 24 and 44 and, concurrently, filed the instant petition. See the amendment filed May 28, 2003. In setting forth the present decision, the above-mentioned amendment has been taken into account including the fact that claims 111-113 are to be considered as belonging to the elected species of Group IV.

The applicants' principal arguments are: (a) claims 13-22, drawn to a direct oxidation fuel system, include the subject matter of claims 1-12 citing Figures 1 and 2A and, hence, these two sets of claims are not independent. Applicants posit that since "a direct oxidation fuel cell system cannot exist without a direct oxidation fuel cell" the foregoing two sets of claims are not "capable of separate use or the "subject of separate sales" (pp. 2-3 of the petition); (b) claims 24-62 claim the same invention as claims 1-12, especially, when the cathode [metallic] diffusion layer in the latter set is also recited in claims 44-62 belonging to the former set of claims (cf. entity denoted by CL under Group IV in the following table) (p. 4 of the petition); (c) claims 63-70 are related to claims 1-62 partly because the direct oxidation fuel cell system embraced by the former set comprises the direct oxidation fuel cell described by claims 24-62 (pp. 4-5 of the petition); (d) claims 71-103 are drawn to a single invention in that claims 71-92 are directed to a direct oxidation fuel cell and claims 93-103 are drawn to a direct oxidation fuel cell system that comprises the "same" components (p. 5 of the petition); and, finally, (e) claims 1-70 constitute one species and claims 71-103 constitute a second species which should include claim 110 (pp. 5-6 of the petition). Applicants contend that claims 104-109, being broader than claim 1, are generic and claim 110 is likewise asserted to be generic (p. 6 of the petition).

In order to address the applicants' arguments and to better assess the species election requirement, attention is drawn to a "claim diagram" as set forth in the following Table. Note that the representative claims depicted in the Table include dependent claims especially where their limitations cause a significant overlap between different groups. Moreover, the terms "fuel cell" and "fuel cell system", as used in the Table, are to be understood as referring to "direct oxidation fuel cell" and "direct oxidation fuel cell system," respectively.

Group	I	II	IV*	V	VI	VII	VIII	IX
Repre-sentative claim(s)	1	13	24, 44	63, 64	71	93, 94	104	110
Invention	Fuel cell	Fuel cell system	Fuel cell (*Elect-ed)	Fuel cell system	Fuel cell	Fuel cell system	Fuel cell system	Means for generating electricity
	M { Me; CaA; CaC	Fc { Me; A; C	M { Me; ACt; CCt	Fc { M_c; A; C	M { Me; CL; ACt; CCt	Fe { M_{gen}; A; C	$Fc^\dagger$ = M { Me; A; C	$Fc^\dagger$ = M { Me; A; C
	CL	CL	CL (44)			CL		
	AL	AL	AL	AL				
	L	L	L		L			
		$\mathscr{E}$		$\mathscr{E}$	$\mathscr{E}$	$\mathscr{E}$	$\mathscr{E}^\dagger$	$\mathscr{E}^\dagger$
		O_2		O_2		O_2	$O_2{}^\dagger$	$O_2{}^\dagger$
		G		G (64)		G (94)		
				Cat		Cat		
							$\mathscr{E}_{dist}{}^\dagger$	$O_{2\ dist}{}^\dagger$
								$A \leftrightarrow C^\dagger$

The symbols used in the above Table represent various constituent "elements" (or limitations in the claims) and are defined thus:

A	Anode
$A \leftrightarrow C^{\dagger}$	Means for coupling anode to cathode
ACt	Anode catalyst
AL	Anodic metallic diffusion layer
C	Cathode
CaA	Catalyst coating disposed on anode face
CaC	Catalyst coating disposed on cathode face
Cat	Catalyst in proximity to membrane electrolyte
CCt	Cathode catalyst
CL	Cathode metallic diffusion layer
$\mathscr{F}$	Source of fuel
$\mathscr{F}^{\dagger}$	Means for providing fuel
Fc	Direct oxidation fuel cell
$Fc^{\dagger}$	Direct oxidation fuel cell means
$\mathscr{F}_{dist}^{\dagger}$	Means for distributing fuel
G	Gas separator
L	Load coupled across fuel cell
M	Membrane electrode assembly
M_{gen}	Generically disclosed membrane electrode assembly
M_c	Membrane electrode assembly including a catalyzed membrane between anode and cathode
Me	Membrane electrolyte
O_2	Source of oxygen
$O_2^{\dagger}$	Means for providing oxygen
$O_{2\ dist}^{\dagger}$	Means for distributing oxyen

It is noted that the number shown in parenthesis next to a symbol, e.g., CL (44), indicates that the element represented by that symbol, CL, appears in the claim, 44, represented by that number. Further, the curly bracket "{" indicates a grouping of elements that comprises an entity. Also, the terminology of "$Fc^{\dagger}$ = M" (see, e.g., under Groups VIII and IX) indicates that a direct oxidation fuel cell means is claimed in terms of a membrane electrode assembly which in turn is constituted from the elements enclosed in the curly bracket referred to above. Moreover, to facilitate comparison, symbols representing the same elements have been placed on the same horizontal level.

Using the above Table as a reference point, contrary to applicants' argument (a), it is evident that the fuel cell system of claims 13-22, i.e. Group I, does not quite describe the fuel cell of claims 1-12, i.e. Group II, since the fuel cell of the former group involves a membrane electrode assembly, M, which has a catalyst coating disposed on the anode and cathode faces (cf. the CaA and CaC limitations), which feature is absent from the corresponding M for the fuel cell belonging to the fuel cell system of the latter group. While Figures 1 and 2A cited by the

applicants do illustrate a fuel cell system and a fuel cell, respectively, nevertheless, these figures are not correlated on a one-to-one basis with the claims of Groups I and II as exemplified by the fact that Figure 2A does not show a catalyst coating (cf. the description at page 11, line 10 of the applicants' own specification). While it is agreed that a fuel cell system "cannot exist without a fuel cell," however, the real issue here is whether or not the particular fuel cell system of Group II requires the specific fuel cell of Group I. Since it has been shown in the foregoing discussion that Group II does not require the fuel cell claimed in Group I, the applicants' argument is deemed to be unpersuasive.

With respect to argument (b), it is seen from the Table that, here too, the fuel cell of Group IV (claims 24-62) involves a different membrane electrode assembly, M, from the one in Group I (claims 1-12) since there is no indication that the anode and cathode catalysts (ACt and CCt) in the former Group play any role in the latter Group. While it is agreed that claim 44 of the elected Group IV recites a cathodic metallic diffusion layer limitation (CL) which is also present in Group I, as stated by applicants and as is apparent from the Table, nevertheless, this line of argument is irrelevant given the difference in the structure of M as described above.

With respect to argument (c), while it is agreed that claims 63-70 of Group V embraces *some* elements recited in claims 24-62 of Group IV, nevertheless there are differences such as (i) there is no element in Group V that corresponds to CL recited in, e.g., claim 44 of Group IV; (ii) the membrane electrode assembly, M_c, of the fuel cell of Group V which includes a catalyzed membrane between the anode and the cathode is different from the membrane electrode assembly, M, of Group IV which recites no such catalyzed membrane; and, last but not least, (iii) such elements as $\mathscr{E}$, O_2, G and Cat (all defined just below the Table above) of Group V are not matched by corresponding elements in Group IV. Therefore, the applicants' argument is unconvincing.

With respect to argument (d), namely, that the [fuel cell of the] fuel cell system of Group VII (claims 93-103) comprises the "same" components as the fuel cell of Group VI (claims 71-92), it is evident that this argument is flawed based on a direct comparison of the presence or absence of various elements in these two groups in the Table above. Thus, such elements as O_2, G and Cat in Group VII are not recited in Group VI and the membrane electrode assembly, M, of Group VI contains specific limitations such as ACt and CCt which fail to find a one-to-one correspondence with the membrane electrode assembly, M_{gen}, of Group VII.

With respect to argument (e), this represents a summation of all of the applicants' previously set forth arguments with respect to claims 1-103. Since each of the applicants' arguments in favour of rejoinder of the Groups embracing these claims has been found deficient, the summation fails to convince. While it is agreed that claims 104-109 of Group VIII are drawn to a fuel cell system which includes a fuel cell, however, that fuel cell, contrary to applicants' arguments, is not the same as the one recited in claim 1 of Group I. Thus, such elements as CaA and CaC of the fuel cell in the latter group are absent from the fuel cell system of the former group, and, such elements as $\mathscr{E}^{\dagger}$, $O_2^{\dagger}$ and $\mathscr{E}_{dist}^{\dagger}$ in Group VIII find no match in Group I. Applicants' argument

that the claims of Group VIII and claim 110 of Group IX are "generic" is without merit because while the use of "means" language which characterizes the claims in these Groups is theoretically open to the inclusion of certain unrecited limitations, however, as pointed out above there still remain elements belonging to one group that are absent from the other one which are evidently not necessarily encompassed by the use of "means" language.

It is observed that, in essence, while there is some overlap in scope across various groups due to the fact that some elements are shared between certain groups, however, the overall situation, as revealed by the Table, is that no two groups are quite alike. Moreover, since the number of individual elements in each group varies from 6 to 9, it is evident that a search and examination of multiple species would pose an undue or serious search burden.

In view of the above discussion, having weighed both the propriety of the species election requirement and the applicants' arguments, the species election requirement is determined to be proper.

The petition is DENIED.

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